THE death is announced of Dr. Gotthilf Heinr. Ludw. Hagen, with whose name for the last sixty years progress in the domain of hydrotechnics in Germany is closely associated. He died at Berlin on the 3rd inst., having nearly completed his eighty-seventh year.

THE death is announced of Dr. A. Bernstein, the well-known author of the "Naturwissenschaftliche Volksbücher." He was born at Danzig in 1812, and died at Berlin on the 12th inst.

ON February 18 an earthquake was felt in several parts of the Department of Algiers. Its duration was very short. The *Turkestan Gazette* states that as many as ninety distinct shocks of earthquake have been felt at Oosh since November 14. Other shocks have also recently occurred at Viernoe and Tashkend. A violent earthquake is also reported from the Birvari district (province of Bitlis, on Lake Van, in Asiatic Turkey) on February 10. Great damage was done, as many houses fell.

MR. W. WHITAKER desires us to point out in reference to the article on the "Geological Survey of the United Kingdom," printed in the last number of NATURE (p. 395), that some of the bulkiest publications of the Survey have appeared since 1855. He favours us with a list of these, in which we are glad to observe his own "London Basin, pp. xii. 620."

IN consequence of a generally expressed wish from many hundreds of intending participators at the forthcoming Ornithological Congress at Vienna, the Committee of the Congress has altered the date for the first meeting from April 16 to April 7. As the Ornithological Exhibition will be held from April 4 to April 14, the ornithologists present in Vienna at that time will have an opportunity of seeing the Exhibition, while at the same time attending the Congress. Numerous Belgian, Danish, French, German, Austrian, Italian, and Russian men of science will meet in Vienna upon that occasion.

THE German Government has issued an edict concerning the preservation of prehistoric burial-mounds which may be discovered henceforth upon German soil.

THE additions to the Zoological Society's Gardens during the past week include a Bonnet Monkey (*Macacus sinicus* ♂) from India, presented by Mr. W. Graeme; a Sambur Deer (*Cervus aristotelis* ♂) from Ceylon, a European Flamingo (*Phœnicopterus antiquorum*) from Southern Europe, presented by Mr. James McGregor; a Vulpine Phalanger (*Phalangista vulpina* ♂) from Australia, presented by Mr. A. H. Lowder; a Pine Marten (*Mustela martes*), British, presented by Mr. Edward de Stafford; a Common Hare (*Lepus europæus*), British, presented by Mr. G. Pottier; a Rhesus Monkey (*Macacus rhesus*) from India, presented by Master A. J. Neill; two Laughing Kingfishers (*Dacelo gigantea*) from Australia, presented by Dr. Evans; a Black-footed Penguin (*Spheniscus demersus*) from South Africa, presented by Mr. F. Bloor; a Greek Tortoise (*Testudo græca*), European, presented by Miss M. L. Fergusson; a Stump-tailed Lizard (*Trachydosaurus rugosus*) from New Holland, a Bearded Lizard (*Amphibolurus barbatus*) from Australia, presented by Mr. J. W. Bostock; a Pike (*Esox lucius*) from British fresh waters, presented by Mr. Charles D. Hoblyn, F.Z.S.; a Lesser White-nosed Monkey (*Cercopithecus petaurista* ♀), a Campbell's Monkey (*Cercopithecus campbelli* ♀) from West Africa, a Ruddy Ichneumon (*Herpestes smithi*) from India, a Bactrian Camel (*Camelus bactrinus* ♂) from Central Asia, three White-crowned Pigeons (*Columba leucocephalus*) from the West Indies, purchased.

OUR ASTRONOMICAL COLUMN

THE SOLAR ECLIPSE OF 1806, DECEMBER 10.—When Rümker was on the point of leaving England to undertake the direction of the observatory erected by Sir Thomas Brisbane at Paramatta, N.S.W., he came into possession of a letter addressed to Maskelyne by Admiral Bligh, Governor of the colony, containing observations of a solar eclipse on December 10, 1806, which was described as almost total; the observations were made at Government House, Sydney Cove, with a three-feet achromatic and two chronometers by Arnold; Rümker communicated the Admiral's letter to Zach, who published it in vol. v. of his "Correspondance Astronomique," with the places of the sun and moon from Delambre and Burckhardt, and the longitude of Sydney Cove, which he had deduced from Bligh's observations. Employing Burckhardt's Lunar Tables and the last Solar Tables of Carlini the elements of this eclipse will be found to be approximately as follows:—

G.M.T. of conjunction in R.A. 1806, Dec. 9 at 14h. 19m. 14s.

	°	′	″	
R.A.	256	19	1	
Moon's hourly motion in R.A. ...		35	3	
Sun's ,, ,, ...		2	45	
Moon's declination	23	1	8	S.
Sun's ,, ...	22	52	2	S.
Moon's hourly motion in decl. ...		0	5	S.
Sun's ,, ,, ...		0	14	S.
Moon's horizontal parallax		56	16	
Sun's ,, ,, ...		0	9	
Moon's semi-diameter		15	20	
Sun's ,, ,, ...		16	15	

The eclipse was therefore an annular one: it was central and annular with the sun on the meridian in longitude 143° 23′ E. and latitude 32° 23′ S. Admiral Bligh's position was not within the annular phase, but on making a direct calculation for it, we find the greatest eclipse at 0h. 41m. p.m. local mean time, magnitude 0·92. Perhaps this is the first eclipse that was astronomically observed at Sydney, and it may be noted in connection with Mr. Russell's historical account of the progress of astronomy at that place, of which we gave some account last week.

THE LATE PROF. KLINKERFUES.—Ernst Friedrich Wilhelm Klinkerfues was born at Hofgeismar in Hesse, on March 29, 1827. He was attached to the Observatory of Göttingen as assistant in 1851, under Gauss; he became provisional director of that establishment in 1859, and in 1868 was confirmed in that appointment. Since 1863 he was one of the professors in the Philosophical Faculty at Göttingen. He was an able practical and theoretical astronomer, and discovered the comets 1853 III., 1854 I., 1854 III., 1854 IV., 1855 II., and 1857 V.; the first of these, which bore his name very generally while under observation, was telescopically observed in full sunshine, and only a few degrees from the sun's place by Mr. Hartnup at Liverpool, and by Schmidt at Athens. In 1860 Klinkerfues proceeded to Cullera in Spain for the observation of the total solar eclipse in July. His work in theoretical astronomy included a method of determining the orbits of the binary stars, and he was the author of a valuable theoretical treatise on the science. When, on the occurrence of the great meteor shower of November 27, 1872, it was found that the meteors followed the track of Biela's comet, and the comet itself was supposed to be close to the earth on that day, Klinkerfues thought it might be found opposite the radiant of the meteors in Andromeda, and accordingly telegraphed to Mr. Pogson at Madras to this effect, "Biela touched earth November 27, search near θ Centauri." It will be remembered that, in consequence of this telegram from Klinkerfues, Mr. Pogson actually detected a comet in the vicinity, but was only able to obtain its place on two mornings; so that the orbit could not be determined. There was a divided opinion at the time as to its connection with Biela, and perhaps this may now be said to be more than doubtful, notwithstanding the singular circumstances attending its discovery. Klinkerfues died suddenly at the Observatory of Göttingen on January 28.

GEOGRAPHICAL NOTES

MR. H. H. JOHNSTON leaves London to-morrow for Zanzibar, to conduct an expedition to Mount Kilimanjaro. The expenses of the expedition are borne by the Royal Society and the British Association, the object being to form as large a collection as possible of the flora and fauna of the highest mountain in Africa.

ANOTHER attempt will be made this year to rescue the United States observing party in Lady Franklin Bay, under Lieut. Greeley. This party, twenty-five in all, went out in August 1881 and in 1882 and 1883 unsuccessful attempts were made to reach them. This year four vessels will be sent out, one of them H.M.S. *Alert*, which we are glad to know has been presented for the purpose of the search to the United States Government. It is to be expected that with such a formidable expedition the Greeley party will be reached, and we fervently hope brought home, though it is to be feared that some at least must have succumbed to the hardships of three winters in 81° N.

THE fourth German Geographical Congress will meet at Munich from April 17 to 19 next. The preparations are now being made. The main subjects for discussion are: the present state of Polar investigation; the innovations relating to the standard meridian; the Glacial epoch; and the mode of drawing large-sized maps for schools. Numerous travellers and investigators have promised to read papers.

DR. WILD of St. Petersburg, the President of the International Polar Commission, is now sending out invitations for the Polar Congress which is to meet at Vienna on April 22 next. All the leaders of the International Polar Expeditions of 1882 are expected to attend.

DR. ZINTGRAFF of Berlin is about to follow Dr. Chavanne to the Congo, by order of the Brussels National Geographical Institute. His special investigations are to be of an ethnological nature.

HERR L. STEINEGER informs *Naturen* that his fortnight's stay in Kamchatka in May, 1883, proved fairly satisfactory. The complete success of the expedition was, however, interfered with by the exceptionally late snowfalls, which had buried the whole district round Petropaulovski under a layer of six to nine feet of snow, the surface of which melted daily under the scorching sun only to be frozen again at night. Among other interesting points he has noted the presence of four distinct species of the sea-eagle in Kamchatka, while Europe and the whole of the North American continent had only one species of this magnificent bird. One of these four, which Herr Steineger has named *Haliæetus hypoleucus*, is distinguished from *H. leucocephalus*, *H. albicilla*, and the giant *Thalassætus pelagicus*, by the dazzling whiteness of some parts of the body and its generally lighter colour. Herr Steineger's collections, which have been sent on to Washington, include the bones of a complete skeleton of the sea-cow, seventeen sea-calves, three skins of the Kamchatkan Alpine sheep, a considerable number of crania of the Cetacea, of which three would appear to belong to new species. Besides these and some 700 skins of birds, with a large number of mammalian crania, he sends back a large and interesting collection of fish, crustaceans, land and freshwater mollusks, and numerous fossil and living plants.

AFTER having done so much in restoring to our maps the old bed of the Amu-daria, the Russian explorers seem to be inclined now to take a quite opposite view. Thus, Prince Hedroits, geologist of the Amu daria Expedition of 1880, after having explored the eastern part of the Uzboy, came to the conclusion that the total want of river-beds in the ravine and the presence of Aral-Caspian mollusks in it are a sufficient proof that the water of the Amu never ran on the stretch between the Sary-kamysh lakes and the Caspian. Now, M. Konshin—a mining engineer who has recently explored the western part of the Uzboy—arrives independently at the same conclusion with regard to the western part of the supposed old bed of the Amu. He considers that its passage between the Greater and the Smaller Balkhan Mountains is a recent strait of the Aral-Caspian Sea, and that the western part of the Uzboy is merely a remnant of the outflow towards the Caspian of the brackish water of the Sara-kamysh lakes. The ravine of the Uzboy would be thus one of the numerous *sors*, or elongated lakes, the likeness of which to beds of rivers had already struck Pallas in the Astrakhan steppes, where the Daban-gol has a length of sixty miles. The view of M. Konshin may be summed up as follows:—The immense Sara-kamysh depression, 4400 miles wide, and at some places 280 feet below the level of the Aral, formed at a geologically recent time a single basin with the Aral; the fossils found on its borders show that it was filled up with at least brackish water. This lake had an outflow into the Caspian; but for 130 miles west of Sara-kamysh there is nothing like a river-bed. The likeness begins only west of Balla-Ishem, where the Uzboy begins. This channel, however, was filled up, not with the sweet and muddy water of the Amu, but with a brackish and rather pure water of the Aral-Sara-kamysh Lake. In fact, in this channel, on its whole stretch from Balla-Ishem to the Caspian, one finds everywhere the typical Aral-Caspian *Cardita*, *Dreyssena*, *Neritina*, and *Hydrobia* in the most perfect state, whilst there are no traces at all of a fluviatile flora or fauna, nor any traces of human settlements. However opposite to current opinion, this view of the Uzboy surely has much to be said in its favour.

THE same geologist publishes in the *Izvestia* of the Russian Geographical Society an interesting account of his explorations in the Kara-kum desert, between Kyzyl-arvat and Khiva. He considers the bad reputation of this desert quite exaggerated. In the neighbourhood of the Caspian and Lake Aral the Kara-kum sands offer a great many difficulties to the traveller. Geologically speaking they have quite recently emerged from the sea, and the *barkhans*, or sandy hills, are devoid of vegetation and move freely before the wind; the same is true with regard to the neighbourhood of Sara-kamysh and the Uzboy. But farther in the steppe the sands are older, and the brushes which cover them render them quite stable, so that the Akhal-Tekkes like better to stay in the steppe, and return to the oasis only for the needs of agriculture. The routes are quite comfortable, with exclusion of steeper ascents and descents on the slopes of the *barkhans*; and the cisterns (*kaks*) when kept in order contain plenty of water; while the steppe yields throughout the year abundance of food for the horses and camels. The *barkhans* are often intermingled with *takyrs*, that is, with places covered with firm clay, on whose surface small canals collect rain-water and bring it to a common basin called *kak*. The *sors*, or elongated ravines, the sandy bottom of which is impregnated with brackish water, are most numerous, especially in certain parts of the steppe; in the neighbourhood of the Akhal-Tekke oasis they run in numerous parallel lines for several dozen miles in length. The Uzboy, which M. Konshin visited at Kurtysh, is a ravine, sometimes crossed by hills of sand, at the bottom of which one perceives a narrow serpentine of brackish water. The Tertiary beds are covered there with a fine dirty dust filled with remains of the Aral-Caspian *Dreyssena*, *Neritina*, and *Cardium*. Above Kurtysh the upposed old bed of the Amu can be distinguished only by these marine remains. Notwithstanding the most careful search, M. Konshin failed to discover any traces of fluviatile deposits at Shikh, where the Charjuy bed of the Amu is traced on our maps. The hills at Shikh are remarkable as a rich mine of very pure sulphur (62 per cent.) One of them would contain at least 160,000,000 cwt. of pure sulphur, and sulphur appears on the surface of very many of them.

DR. REGAL, travelling for the Geographical Society in Central Asia, has returned to Tashkend through Sarafshan and Samarcand, after visiting Hissar, the Mura Pass—never before explored—the town of Karatag, and Baldshan, Duway, Rushan, and Shignan. Dr. Regal intends to start again in a few weeks for Baldshan, and in the spring to continue his explorations as far as the Kashgar frontiers.

COLONEL PREJEVALSKY, with his Cossacks, must be now in Mongolia, on his way towards Thibet. The other well-known explorer of the Turcoman region of the Transcaspian, M. Lessar, is again on his way to the scene of his geographical triumphs along the Persian frontier to complete his work for the General Staff. He will probably be absent another year or a year and a half.

THE Director of the Russian Observatory at Peking, Dr. Fritsche, who made last winter a journey through Southern China, from Peking to Kaï fong-fu on the Huan-Lo, has determined on his route the positions and the magnetic elements of forty-six places. A few days after his return to Peking he left again and went, *viâ* Changhai kuan, on the Gulf of Pe che-li, to Tsitsigar Mergen, Aïhun, and Blagoveschensk, on the Amur, determining the positions and magnetical elements of sixty three new points.

A CORRESPONDENT in *Naturen* draws attention to a curious narrative of an expedition to high northern latitudes, undertaken in 1266, at the instigation of priests belonging to the Monastery of Garde in Greenland. This narrative is derived from an Icelandic transcript of the so-called "Hauksbok," compiled about 1300 by the Norsk law-expounder, Hauk Erlandsön. It must be observed, however, that the particulars of the Garde Expedition are not to be found in the still extant parts of the original manuscript of the "Hauksbok," from which various pages have been lost. Notwithstanding the absence of this conclusive proof, northern scholars are inclined to accept the later transcript as a *bonâ fide* version of the original before the loss of its missing parts, and if this assumption can be maintained, we have evidence that the Northmen advanced four days' journey north of 76°. The object of the expedition, we are informed, was to discover what lands and people were to be found north of the Christian Station at Garde, and whether the much dreaded Skröllinger or native Esquimaux occupied those unknown regions in any formidable numbers. The seamen, we are told, saw many islands on which there were traces of the presence of these people, but they were unable to land, owing to the number of bears which, together with numerous seals and whales, frequented the coasts. In reference to the high latitude said to have been reached by these early explorers, and which is inferred from the description of the height of the sun on St. James's Day (July 25), it may be observed that a runic stone was found in 1824 in 72° 55′ N. lat., about twenty miles north-west of Upernivik, the northernmost existing Danish station. The inscription, which records that three men, whose names are given, erected the stone as a landmark, concludes with six runic characters, which have been variously interpreted to indicate the years 1135 and 1235.

FROM his scientific expedition to Anatolia, Syria, Egypt, India, Indo-China, China, and Japan during the years 1880-83, Dr. Emil Riebeck has lately returned to Europe laden with ethnological and archæological treasures of all sorts. This splendid collection, on which the enterprising explorer has expended no less than 30,000*l.*, has during the past few months formed a chief attraction to naturalists in Berlin, where it has been on exhibition at the Kunstgewerbe Museum. Here the available space was not sufficient to allow of a thoroughly systematic arrangement of the objects, which however have been roughly disposed in three main geographical groups:—(1) Western Asia and Africa; (2) India and Further India; (3) East Asia (China and Japan). Some idea of the immense variety of articles here brought together may be had from the detailed catalogue of Dr. Riebeck's "Asiatic Collection," recently issued by Messrs. Weidmann of Berlin. From Palestine and Syria we have objects of every description; while the articles from Somaliland, which are very numerous, illustrate almost every phase of the social life of the little known inhabitants of that region. Several specimens are shown of the masks used in Ceylon at the "devil dances" performed during illness. The masks represent divinities of the Hindu mythology, rakshasas or demons, nāgakanyās or snake masks, lions, tigers, crocodiles, negroes, Mussulmans, Malays, &c. India is largely represented. From Burmah, where the Irrawadi was ascended as far as Bhamo, were brought many costly articles, such as royal coronets and dresses, alabaster and gilt wooden statuettes of Buddha, masks of strolling minstrels and players, amber rosaries, richly carved consols, lacquer ware, ornamental drinking vessels, writing materials, &c. A visit to Bangkok yielded models of Siamese floating houses, fishing gear, agricultural and industrial implements, &c. Amongst the most characteristic objects from China are brightly painted clay models of popular types, bronze vases, chased, inlaid in silver, and studded with gems; shallow dishes of "imperial bronze" (yellow picked out in red), silver teapots, artistic articles in jade, rock crystal, and marble, &c. The rich and varied Japanese collection comprises specimens of all the most characteristic productions of the country, especially Satsuma porcelain and other ceramic ware, illustrating the development of Japanese porcelain from the sixteenth to the nineteenth century. During the first part of his journey Dr. Riebeck was accompanied by Dr. Moock, who, after escaping from many perils amongst the Bedouin tribes in the Moabite country, was drowned in crossing the Jordan, and now lies buried in Jericho. During the visit to Egypt he was attended as far as the Nubian frontier by Dr. Schweinfurth, who again accompanied him in March 1881 to the south coast of Arabia and the Island of Socotra. During the rest of his wanderings throughout the Far East Dr. Riebeck had for his associates M. C. B. Rosset, who joined him in Germany, and Dr. Mantei, whom he engaged in Egypt after the untimely death of Dr. Moock.

IN the March part of *Good Words* Mr. Edward Whymper gives some particulars of his journeys in Greenland which have not been heretofore published; and states that he found the height of the interior in the latitude of Umenak (about 70° 30′ N.) considerably exceeded 10,000 feet. Mr. Whymper says that from the various mountains he has ascended on the eastern side of Davis Straits he has had continuous views of the glacier-covered interior of Greenland between about 68° 30′ and 71° 15′ N. lat., and that there is no break or depression within those limits, and that the country is everywhere so absolutely covered by snow and glacier that not a single rock or crag can be seen.

ON THE PHENOMENA EXHIBITED BY DUSTY AIR IN THE NEIGHBOURHOOD OF STRONGLY ILLUMINATED BODIES[1]

IN 1870 Dr. Tyndall described the dark or dust-free plane which rises from a hot body in illuminated dusty air, and gave two explanations of the dust-freeness of this dark space. Another explanation was suggested by Dr. Frankland. In 1881 Lord Rayleigh re-examined the phenomenon, and discovered that a cold body gave a similar down-streaming plane. He also suggested a totally different explanation. The writers discuss all these suggested explanations, and see reasons for rejecting them all. They have, moreover, observed that the dark plane rising from a hot body is only a prolongation of a well-defined dust-free *coat* of nearly uniform thickness under ordinary circumstances surrounding the body, and they point out that this dark coat is the thing really requiring explanation, the dark plane being merely due to the up-carrying of portions of this coat by convection currents.

The preliminary experiments were described in a letter to NATURE last July (vol. xxviii. p. 297).

The dark coat is found to increase in thickness with the temperature of the body, becoming very thick at high temperatures, say 1000° C., but being narrow for temperatures only a few degrees above the air. When the temperature of the body is the same as that of the air surrounding it, the dust-free coat is either non-existent or exceedingly thin. The thickening of the coat by a rise of temperature is interfered with by convection-currents, which sweep the outer portions off more rapidly than they can be renewed, and so make the coat thinner than it otherwise would be. By means of a blast of air the coat can be almost wholly or entirely blown away; but convection-currents are never able to sweep it off, for the same cause which increases the convection-currents also broadens and assists the formation of the coat. The coat can be seen on round rods of all materials, on flat plates, both horizontal and vertical, on hollow and irregularly shaped pieces, and in general on every substance whatever. Nevertheless the behaviour of certain bodies is peculiar, and is detailed in the paper; such bodies, for instance, as a stick of phosphorus, which itself gives off smoke, a volatile solid like camphor, moistened solids like soaked carbon, liquids like sulphuric acid water and ether, and thin films of glass or mica. Other substances examined are: copper, iron, zinc, electric-light carbon, charcoal, glass, mica, selenite, selenium, Iceland spar, tourmaline, potash, rock-salt, bismuth, silver, chalk, and all kinds of paper. In every case the method of examination was as follows:—A glass box was mounted in front of the nozzle of an electric lantern, and the body to be examined was supported in any convenient manner, so as to be about the middle of the box, and to be well illuminated. Smoke was introduced, the lamp turned on, and the effect examined by looking along the length of the body at right angles to the light. Sometimes a microscope was used, but it was not necessary except for measurements. A hand lens is useful. For smoke, tobacco was the most common, but ammonic chloride was used when a distinctly volatile smoke was desired, and magnesic oxide whenever a non-volatile and incombustible smoke was wanted. Any kind of smoke serves equally well. Hydrogen and carbonic acid and other gases have been used as well as air: in hydrogen the coat is much thicker, in carbonic acid a little thinner, than in air. The effect of pressure on the dark coat was examined, and it is found that the coat broadens as the pressure diminishes. An increase in pressure of 4½ atmospheres renders the coat very thin and sharp, and at the same time causes the convection-currents to be sluggish.

The writers considered that it would be very instructive to examine whether a dark coat and plane could be observed when a warm body was immersed in a dusty *liquid;* and they accordingly devoted a good deal of attention to this point. After failures with mastic and other substances, they succeeded in observing a very thin, dark coat on the surface of an iron wire immersed in water

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[1] Abstract of a paper by Oliver J. Lodge and J. W. Clark, read at the Physical Society, February 9.